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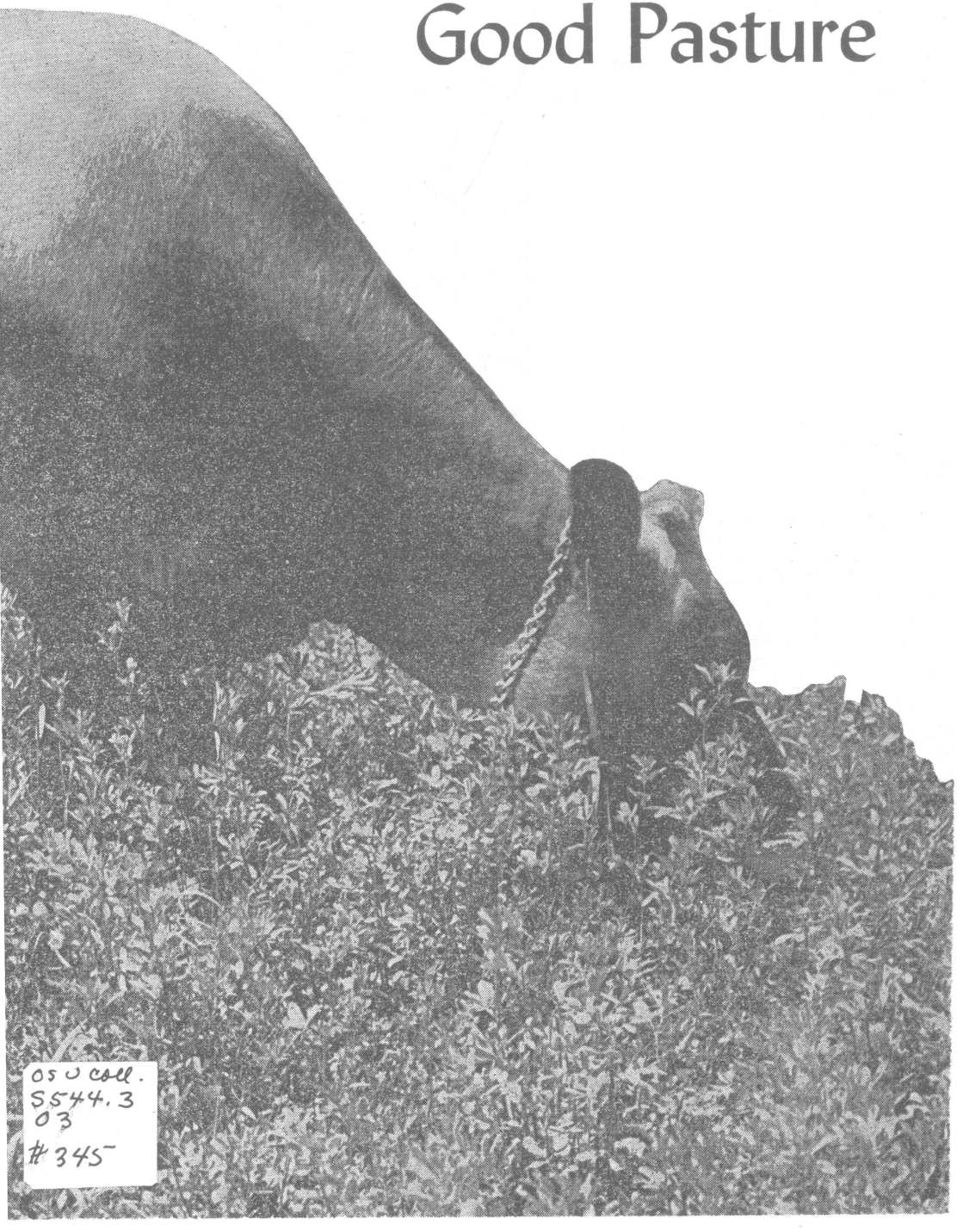
Good Pasture



You'll find

Good Pasture

your best crop

D. R. Dodd

GOOD pasture promotes the health of farm animals and generally provides the most economical livestock feed. Improving the quality and production of the pasture fields, and providing an adequate supply of forage at all times during spring, summer and fall is one of the cheapest and easiest ways of improving net farm income.

However, pasture yields profit only when it is efficiently utilized by livestock. High production and good use of pasture require careful planning and management. Planning and management include fertilizer treatment, balanced types of pasture plants, controlled grazing, and selection of the kind and quality of livestock grazed.

Growth and Feeding Value Vary

Pasture plants are not uniform in rate of growth and quality of forage throughout the season. Bluegrass pasture is commonly grazed first in the spring, but it is less productive in midsummer than orchard grass or smooth bromegrass. Red clover and timothy in rotation pastures supply grazing a little later in the spring than bluegrass, but they decline less in production in midsummer. Ladino clover produces abundantly during most of the grazing season but is retarded greatly by continued hot, dry weather in July and August.

Even alfalfa, a comparatively good grower in midsummer, makes about half its total season's growth in the first third of the season. This means that the same acreage will carry only half as much livestock in midsummer and early fall as during the earlier part of the season. Furthermore, alfalfa cannot be maintained under season long grazing. It should be rotationally grazed and permitted to reach the hay stage for at least one crop during the season.

Sudan grass, on the other hand, is a hot weather annual. It produces nothing in the early part of the season but grows rapidly in midsummer.

Variation in rate of growth parallels variation in quality. If the best quality is to be obtained, pasture herbage should be grazed at or near the time of its most rapid growth.

Growth vs. Feed Requirements

During an average year, improved bluegrass pasture produces somewhat after the manner of the upper wavy line

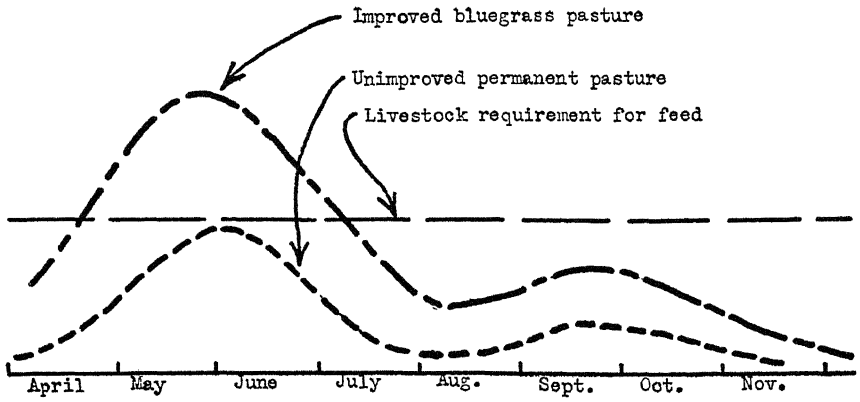


Fig. 1.—Livestock requires an even supply of forage throughout the grazing season, but permanent and improved bluegrass pastures fail to meet the need.

in Figure 1. Livestock requires a more or less uniform feed supply as indicated by the straight line. Unimproved permanent pasture, as indicated by the lower wavy line in Figure 1, seldom produces enough at any time to feed the stock a good farm should carry. Unimproved permanent pasture lacks quality, regardless of yield.

The average rotation or meadow crop pasture cannot be grazed as early in the spring as bluegrass-white clover but produces more feed in midsummer.

A good pasture program provides grazing in accordance with the requirements of the livestock. If this is not possible, the livestock load must be adjusted to the pasture, or other feed provided. Frequently, profits from livestock are limited more by insufficient feed than by the number of animals kept. Feeding grass silage or other forage in midsummer may be substituted for midsummer pasture. But generally harvested forage is more expensive and less satisfactory than good pasture.

Building a Pasture Program

The following suggestions will help determine what pasture crops, acreages and management practices can be combined under individual farm conditions.

Inclusion of rotation or hay type pasture on farms where bluegrass-white clover predominates provides extra midsummer pasture and makes possible the utilization of surplus growth as hay or silage in favorable years or when the livestock load is below normal. A surplus of the hay type pasture is less likely to be wasted than excess permanent pasture. The permanent pasture has the advantage of being cheaper and requires less time and labor.

TABLE 1.—Animal unit equivalents in daily pasture consumption. (Number of animals of various kinds that will consume approximately as much pasture as one cow in one day.)

Kinds of Livestock	No. of Animals	Kinds of Livestock	No. of Animals
Dairy cows	1.0	Ewes with lambs to weaning (fine wools)	6
Dairy heifers	2.0	Ewes with lambs to weaning (coarse wools)	5
Beef cows	1.0	Lambs after weaning	12
Beef steers and heifers	2.0	Sows at 300 lbs	5
Horses and mules	1.0	Pigs at 50 lbs	50
Colts	2.0		
Hogs at 150 lbs	16		

Pasture Preferred by Livestock

Different kinds of livestock use different proportions of pasture and grain. Cows, for example, take much more pasture proportionately than hogs.

Table 1 lists the number of animals of various kinds that may be expected to consume approximately the same amount of pasture. From Table 1 total pasture requirements in terms of animal-unit grazing days of all the animals on the farm may be figured for each month of the grazing season.

A particular type of pasture is not equally satisfactory for all kinds of livestock. It may pay to separate different kinds of stock and provide separate areas for cattle, swine and poultry. For example, Ladino clover may be set aside for the exclusive use of hogs or poultry.

Determining Production

Table 2, pages 6 and 7, gives the number of animal unit grazing days from hay-type pasture that may be expected from one acre based upon the anticipated hay yields indicated. AUGD (animal unit grazing days) are given for the whole season and for each month.

In order to determine the animal unit grazing days of pasture that might be available, first estimate the hay yield that might be expected if the crop were permitted to mature. It is assumed that there is a definite relationship between the hay yield and the pasture yield. In Table 2 certain anticipated hay yields are indicated. If it appears that a field would produce twice this yield of hay, then the pasture figures would be doubled.

For example, assume the crop is alfalfa-grass with a stand and growth that indicates a yield of 8000 pounds of hay. This is twice the yield indicated in Table 2 for this crop; so the grazing days of pasture would be double those indicated for the season and for each month. The probable animal unit grazing days of pasture for any other crop (for which the hay yield can be estimated) may be figured in the same manner.

For Quick Figuring

Another way of determining the total animal unit grazing days from anticipated hay yield is to take 2 percent of this anticipated hay yield in pounds. This figure will approximate the total animal unit grazing days of pasture.

Legumes produce more midsummer pasture than grass. However, bromegrass, orchardgrass and tall fescue do produce more than timothy in midsummer. Therefore, where these grasses are present in considerable amount, May and June figures may be lowered slightly and August and September figures raised proportionally. The total animal unit grazing days of pasture will still hold the same relationship to hay yield as indicated in Table 2.

Ladino clover will have about 30-40 percent greater carrying capacity than the average of the other plants listed in Table 2. Therefore, if a mixture were half Ladino, about 15-20 percent might be added to the total grazing days of pasture. Where the Ladino content is not high, it may be ignored; and the estimated carrying capacity may be based entirely upon anticipated hay yield.

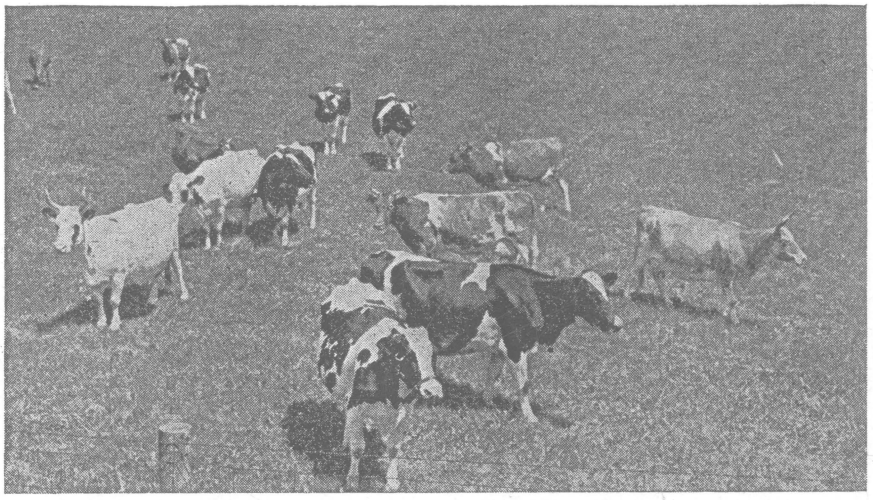
Korean lespedeza produces well in the latter part of the season. The presence of this legume in timothy or timothy-clover mixtures to the extent of 25-50 percent in the southern part of the state may justify adding 20 percent to the animal unit grazing days during August, September and October.

Permanent Pastures

You cannot accurately estimate hay yields of permant pastures, straight Ladino clover, rape and some other types of pasture. Therefore, Table 3, pages 6 and 7, gives the animal unit grazing days of pasture that may be expected from pastures not harvested as hay. To use this table, it is necessary to decide where the particular pasture classifies in this table. There will be very few instances in which the upper limits of production will be reached.

Adjusting Pasture and Livestock

From Tables 2 and 3, one may estimate how many days of pasture would be available for the season as a whole and for each month. Checking this estimate against the requirements of livestock on the farm reveals how good or



Cows "turn up their noses" at bluegrass that quits growing in dry midsummer.

poor the fit is and where adjustments must be made.

In fitting a suit of clothes, all the adjustments must be made in the garment; but in fitting pasture and livestock, some adjustments can be made each way. Sometimes adjusting the livestock to the pasture or feeding grass silage or other forage may be easier than changing the pasture program.

Two factors have much to do with providing a balanced pasture supply. One, is the production level. The other is the kind of pasture. At a high production level, pasture crops start earlier, grow more uniformly through the season and continue to grow later in the fall. The production level is the first essential in building a profitable pasture program.

Balancing production by months at a low level means little. Production at the low level is not profitable enough to justify the effort to even out pasture feed through the grazing season.

However, even though raising the production level is the first and most profitable adjustment, it is not enough and should always be accompanied by selection of pasture crops, provisions for barn feeding or adjustment of livestock load so as to efficiently utilize the pasture and adequately feed the animals.

Improving Rotation Pastures

A satisfactory farm pasture program depends upon better rotation and permanent pastures than we now generally have. Means for the improvement of rotation pastures are considered in the following paragraphs.

Marked improvement in the production of rotation pastures may be accomplished by (1) adequate lime and fertilizer treatment, (2) the seeding of more appropriate seed mixtures, and (3) better grazing management.

Lime in the amount needed should be applied first. This may be done at any time in the growing season on sod or on plowed land.

Apply at seeding time 600 pounds of fertilizer where the sod is to be held 2 years, or 400 pounds where it is to be held 1 year. The fertilizer may vary with soil types and other factors but a 3-12-12 or a 4-16-8 is preferable at the time of seeding fall sown grains and 0-20-20 or 0-20-10 applied in band placement when seeding spring grains. When drilling legume seeds in the spring on wheat, 0-20-0 or 0-20-10 may be used at a rate of 150-200 pounds per acre. This amount of fertilizer and the legume seed may go down the tubes and into the ground together.

TABLE 2.—Animal Unit Grazing days[1] for the year and by months based upon the

Crop	Anticipated hay yield	A.U.G.D. for year
Alfalfa-grass mixture, meadow to stay next year. (Poor, state average)	4000	80
Alfalfa-grass mixture, meadow not to stay next year. (Poor, state average)	4000	96
Alfalfa-grass mixture after June hay. (Poor, state average)	4000	40
Alfalfa-grass mixture, after June hay, meadow not to stay next year	4000	56
Red clover-grass, meadow to stay next year. (Poor, state average)	3000	60
Red clover-grass, meadow not to stay next year. (Poor, state average)	3000	70
Red clover-grass, after June hay, hold meadow next year. (Poor, state average)	3000	20
Red clover-grass, after June hay, plow next year. (Poor, state average)	3000	30
Old grass meadow. (Poor, state average)	2000	40
Sudan grass	4000	80
Korean lespedeza in grain, grain removed as hay or grain	2000	40
Early sown winter barley or rye. No hay or grain removed	3000	60
Wheat or rye seeded after fly free date	2500	60
Sweet clover grazed first in fall then in spring	4000	80
New meadow seedings. Do not overgraze	1000	20
Birdsfoot trefoil-grass. No hay removed	4000	80

[1] An animal unit grazing day represents the amount of pasture required to provide 16 pounds of total dige of 4% milk.

TABLE 3.—Pasture crops with the animal unit grazing days for the year and by mo grass hay. Yields as indicated or their equivalent in digestible nutrients.

Crop	Hay yield equivalent	Total A.U.G.D.
Permanent pasture. Untreated, very poor	1000	20
Permanent pasture. Untreated, poor	2000	40
Permanent pasture. Untreated, fair	3000	60
Permanent pasture. Lime phosphate. Good	4750	95
Permanent pasture. Lime phosphate, some manure. Very good	6500	130
Permanent pasture. Lime, phosphate, potash, manure. Excellent	8250	165
Permanent pasture. Lime, phosphate, potash, manure. Super Excellent	10,000	200
Ladino clover. Fair	6000	120
Ladino clover. Good	8000	180
Ladino clover. Excellent	12,000	240
Rape	5000	100

anticipated hay yields and for the various crops indicated.

Animal unit grazing days per acre per month							
April	May	June	July	Aug.	Sept.	Oct.	Nov.
2	22	27	12	12	5	..	..
2	22	27	12	12	12	6	3
..	..	..	17	17	6	..	..
..	..	..	17	17	13	6	3
2	18	21	8	8	3	..	..
2	18	21	8	8	6	5	2
..	..	..	8	8	4	..	..
..	..	..	8	8	7	5	2
..	10	12	5	2	5	4	2
..	..	..	20	25	25	10	..
..	..	..	5	15	15	5	..
10	25	10	..	..	..	8	7
10	25	15	..	..	..	..	..
7	23	23	14	6	6	6	..
..	..	..	..	12	8	..	..
..	15	20	20	15	10	..	..

stible nutrients, or the amount that that would be needed by a 1000 pound cow in one day and produce 20 pounds

nths for the various type of pasture indicated and the equivalent in feed of good legume-The solid line represents dependable production, the broken line doubtful production.

Animal grazing day per acre by months							
April	May	June	July	Aug.	Sept.	Oct.	Nov.
..	6	7	2	1	2	2	..
..	12	13	4	2	5	4	..
..	17	19	7	3	7	7	..
6	24	26	10	5	11	11	4
9	33	33	14	7	14	14	6
13	42	42	17	9	17	17	8
16	52	52	20	10	20	20	10
6	30	30	16	8	18	12	..
10	40	40	27	14	28	21	..
16	50	50	37	20	37	30	..
..	25	26	12	9	9	14	5

Fertilizing

Where rotation pastures are retained for two or more years, additional fertilizer applications are desirable. Where the sod contains a high legume content, this should consist of 300-400 pounds of a fertilizer such as 0-10-20, 0-20-20, or a 0-12-12, or 5 to 8 tons of manure supplemented with 200 to 300 pounds of 20 percent superphosphate per acre, before the second hay year and every year thereafter.

Where the sod is largely grass, such as timothy or bromegrass, add nitrogen to the usual applications of phosphate and potash. The nitrogen should be applied annually in the fall or early spring at the rate of 50-80 pounds per acre. This is the equivalent of a minimum of 250 pounds of sulfate of ammonia or 150 pounds of ammonium nitrate. A heavy application of fresh rich manure may replace the nitrogen fertilizer. Five to eight hundred pounds of 10-10-10 per acre may be used annually in place of the separate nitrogen and phosphate and potash. The nitrogen, either alone or in the 10-10-10, is effective in producing extra early pasture.

Seeding Mixtures

On farms specializing in livestock raising it is usually desirable to hold rotation or hay type sods two or more years. One half to one pound of Ladino clover should be added to or used to replace a part of the other legumes in any good hay mixture. Adding Ladino will increase total pasture production. One good mixture consists of alfalfa, 7 pounds; red clover, 3 pounds; and Ladino clover, 1 pound; all seeded in the spring; and 3 pounds of timothy seeded in the fall or 6 pounds in the spring.

Where the sod is to be held for 2 or more years, 5 to 8 pounds of bromegrass or 4 pounds of orchardgrass may be used in place of the timothy or other grass in the regular hay mixture. Bromegrass seed should be covered very shallow. It may be mixed with 100 to 300 pounds of 0-20-0 or 0-20-10 and drilled from the fertilizer hopper in the early fall, either with an early fall grain or alone. Another way is to mix the bromegrass with 6 pecks of oats or with fertilizer and seed very shallow in the spring.

Eight to 10 pounds of alfalfa, 1 pound of Ladino clover and 7 pounds of bromegrass make an excellent long-lived combination. Bromegrass is more palatable than orchardgrass and yields better in midsummer than timothy.

Orchardgrass, when properly managed, produces early pasture, but sheep do not make good use of orchardgrass. For hay it must be cut very early and is not a heavy yielder. It should be seeded in the spring only.

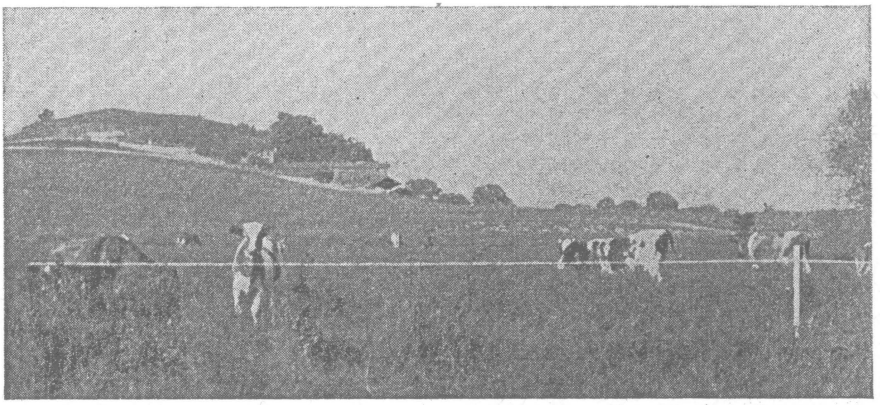
In the southern third of the state, on land where success with alfalfa and red clover is doubtful, 15 pounds of Korean lespedeza and 8 pounds of orchardgrass make a good pasture.

Where the pasture is in a short rotation and will be used only to a limited degree, following grain harvest, and to capacity during the early part of the following years, sweet clover alone, at the rate of 10 to 12 pounds of hulled scarified seed per acre, or in combination with 4 to 6 pounds of orchardgrass, is good. The orchardgrass is best seeded in the spring at the same time as the sweet clover. (See Ohio Agricultural Extension Service Bulletin No. 261, "Meadow and Pasture Seedings" for more detailed suggestions and other seed mixtures.)

Limit Grazing

Grazing should be limited by the capacity of the pasture. The younger the plant or the newer the growth, the richer it is in nutrient content. But the younger it is when grazed or cut, the slower will be its recovery and the lower the total yield.

The larger hay type plants, such as alfalfa and timothy, will not stand the continuous close grazing that may be used with bluegrass and white clover. Control the grazing of hay type pasture to maintain a growth of 6 or more inches. Grazing should not be closer than 4 inches. In central Ohio grazing of alfalfa mixtures should not begin before May 15 nor continue beyond September 10. At least once during the season, growth to the hay stage should be permitted.



Electric fence makes rotation grazing practical and economical.

Rotational grazing is preferable. The usual practice is to graze 1 week and rest 3. When properly timed rotation grazing may be expected to result in 25 percent greater production per acre. However, if animals are held too long on a limited area, milk production or rate of gain may decline due to shortage of pasture.

Locating the alfalfa mixtures or sudan grass where animals have access to the earlier grazed permanent pasture area simplifies grazing management and reduces the danger of bloat.

Mowing Saves Feed

Mowing of rotation pastures to save the surplus growth for hay or silage is good practice. There are times when the mowing of a surplus and matured growth is desirable to encourage the development of a more palatable growth though clippings are too short to make hay. Such mowing, when needed, should come at about the time that a hay crop would normally be removed.

Mowing at the beginning of or during a dry period serves only to reduce the herbage available and retard future growth. Mowing only a portion of the pasture at one time, reduces the risk of an inadequate pasture supply caused by unfavorable weather.

Fresh legume growth following mowing of an alfalfa-Ladino-grass mixture is more likely to produce bloat. Some coarse material should be left or hay or other mixture made available. Both mowing and rotation grazing are means to an end and not ends in themselves. They should be used only when and if needed and not with calendar regularity.

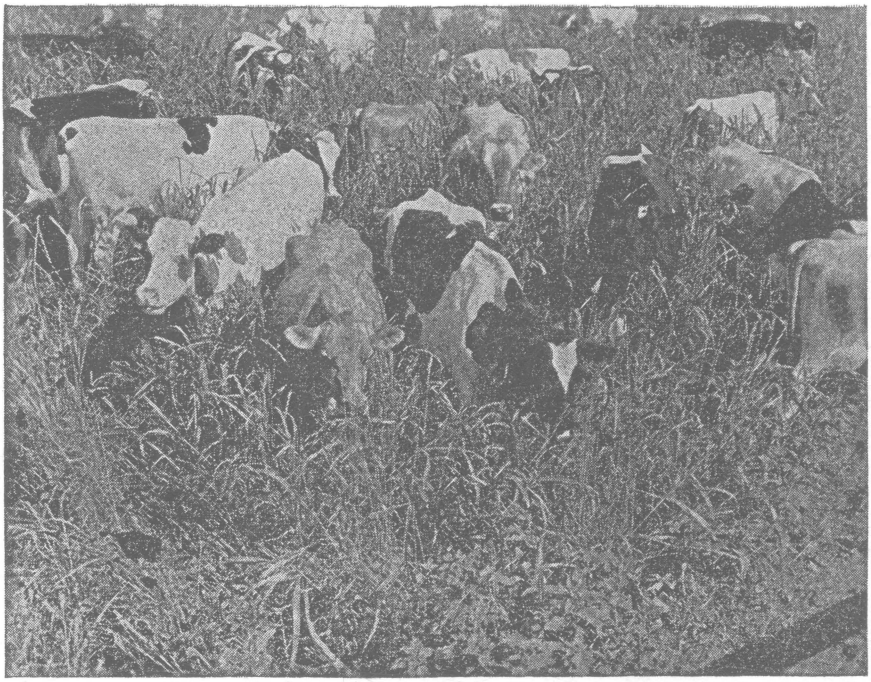
Emergency Pasture Crops

Sudan grass: This is a vigorous growing annual that makes its maximum growth in July, August and September. It is palatable and readily eaten by dairy cattle, beef cattle and sheep. Due to the extra work of establishment and the possibility of failure, sudan grass is less desirable than alfalfa mixtures and should be used as an emergency and not a regular pasture crop.

Culture. Seedings are usually made on a well-prepared firm seedbed between May 20 and June 10. Seedings may be made up to July 15. The seed should be covered not more than one-half inch. Cultipacking before and after seeding is helpful.

The recommended rate of seeding is 20 to 30 pounds per acre, which will usually result from drilling from the wheat side of the grain drill set at the 2-peck rate. In case the drill will not sow this small amount the seed may be diluted with cracked corn. Tift, Piper and Sweet are good varieties.

Sudan grass should be grown on productive soil. Although some cases of poor response to fertilizer have been observed, yield increases of 50 percent or more have resulted in others. The



Sudan makes the best emergency midsummer pasture.

crop is very responsive to nitrogen. Where there is a shortage of this element 500 pounds per acre of 10-10-10 is recommended when seeding.

In 6 weeks from seeding, with a favorable growing season, sudan grass will be 15 inches high and ready to graze. It should not be grazed before it has reached 15 inches in height since young sudan has been known to carry sufficient cyanide to be poisonous. It is suggested that livestock be observed for an hour when first turned into sudan, and that the gate to another type of pasture be left open so the animals may come and go as they choose.

It is well to divide the sudan pasture by an electric fence and to permit one half to grow while the other is being grazed.

Ladino Clover in Mixtures

In addition to its use in a mixture with alfalfa and grass Ladino clover is sometimes used alone or in combination with perennial rye grass as a special pasture for poultry, hogs and sheep. Used in this manner, it has about the same carrying capacity as indicated for an alfalfa-Ladino-grass mixture, but is less productive in midsummer or in dry periods. It is very palatable and persists longer under grazing condition than alfalfa.

Ladino may be sown with or without a companion crop (such as 5-10 pounds of ryegrass) in early spring at a rate of 2 or 3 pounds per acre. It should be fertilized with an 0-12-12, 0-20-20 or 3-12-12 at the rate of 600 pounds per acre when seeded and annually thereafter with 300-400 pounds of 0-10-20 at any convenient time except in hot dry weather.

Dwarf essex rape is sown as a special pasture for sheep and hogs. Rape requires a productive soil and responds well to lime and fertilizer. An application of 300 to 500 pounds per acre of a 4-16-8 or 10-10-10 is recommended. When the seed is sown broadcast or from

the grass seed hopper of the grain drill 5 to 8 pounds of seed is required. If sown in 24-inch rows 3 pounds of seed is sufficient. This permits cultivation for weed control. For early spring seedings, the drilled rate may be reduced to 3 to 5 pounds with 1 bushel of oats drilled at the same time.

The small grains when grown for pasture may be seeded at a heavier rate than for grain. For poultry grazing this rate may be as much as 3 or 4 bushels per acre.

New meadow seedings made in small grains are more likely to succeeed where the grain crop is pastured. However, rye and barley may be sown early in the fall, pastured in the fall and again in April and then make a grain crop. Wheat that is sown before the fly safe date, should be used for spring pasture only. Spring sown oats provides good pasture only in May and June.

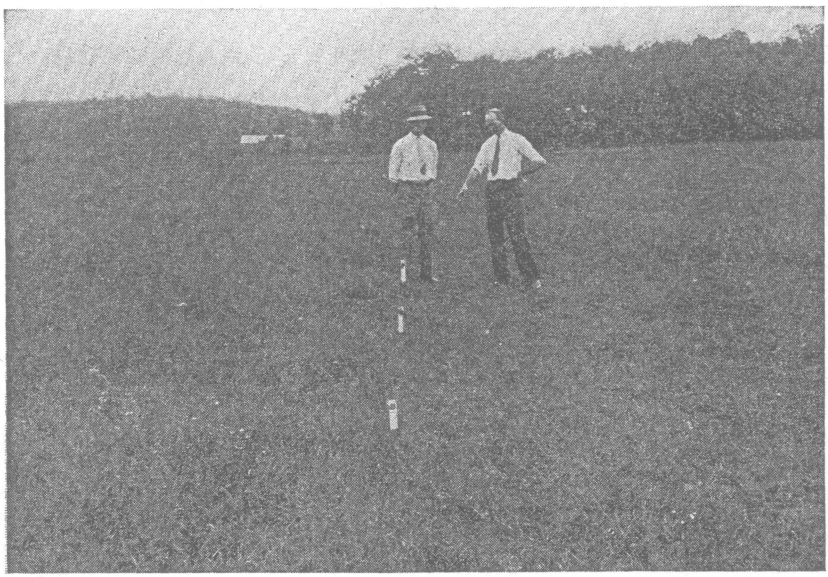
In some states the small grains are extensively used for spring and fall pasture. In Ohio the soil is very frequently not in condition to permit grazing when these crops are ready. Nitrogen treated grass sods are, therefore, usually preferable.

Birdsfoot Trefoil

Birdsfoot trefoil is a deep rooted perennial legume with the midsummer growth habits of alfalfa. It stands close pasturing and will stay in land too poorly drained for alfalfa. It is productive on land too drouthy for ladino clover. The broad-leafed types are generally recommended for Ohio, but the low growing narrow-leafed type stands close grazing. Meadow fescue or timothy may be seeded with trefoil. Bluegrass will come into the field in a few years.

New York farmers have grown birdsfoot trefoil for 20 to 30 years. The Empire variety was developed there. Supply of Empire seed is limited. A mixture of Empire and imported seed is recommended for Ohio.

Birdsfoot trefoil is considerably more productive in a dry summer than white or ladino clover. It may be harvested in June for hay or silage. Where alfalfa is uncertain due to poor drainage, birdsfoot trefoil may take alfalfa's place in long-lay meadows. It is not recommended to replace alfalfa or red clover where these crops do well. It does not yield as



Cattle prefer fertilized grass. They stopped grazing where stakes mark the edge of fertilized area on an Adams county pasture.

much hay as alfalfa or red clover under conditions favorable to these crops.

Birdsfoot trefoil does best on soils limed to the red clover level, pH 6.0 to 6.5. It should be fertilized at seeding time with 400 to 600 pounds of 3-12-12 or a similar grade, and top dressed with 400 to 500 pounds 0-20-10, 0-20-20 or 0-10-20 every second year. The higher potash is needed where the crop is removed for hay.

Birdsfoot trefoil cannot stand too much competition the seeding year. A seeding of 5 to 6 pounds of birdsfoot trefoil and 4 pounds of timothy per acre is recommended, but other grasses may be substituted for timothy. No other legume should be included in the mixture, and only one grass. Band seeding with 4 to 6 peck of oats per acre is recommended. A special birdsfoot trefoil inoculent is necessary.

The birdsfoot seeding makes a better growth if the oats are grazed or harvested for hay before they reach the milk stage. The livestock should be taken out when the oats have been grazed down to a height of 6 to 8 inches and the remaining growth clipped and left on the field. The field should be mowed if weeds become a problem during the mid-summer. Light grazing is often possible during the late summer or early fall, but over-grazing should be avoided.

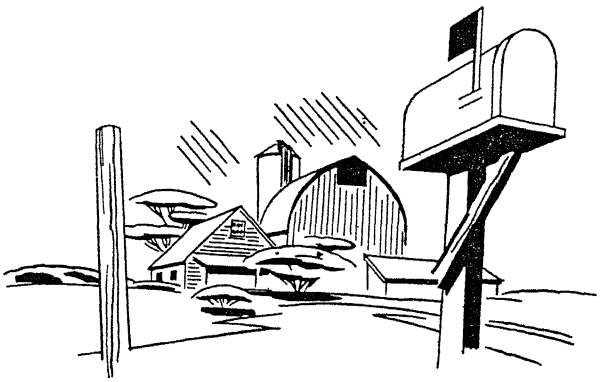
One of the following methods of management should be followed:

(1) Permit no grazing until mid-June or early July. The bluegrass will be dead ripe, but the combination of bluegrass and birdsfoot trefoil makes a highly palatable, nutritious pasture, and produces large summer yields. Graze as growth permits later. Birdsfoot continues to grow and remains palatable after it has bloomed and set seed.

(2) Graze the birdsfoot trefoil and bluegrass in the early spring. Remove the livestock by June 1. Permit it to recover during June. Graze again as growth permits.

(3) Mow for hay or silage in early June, allow it to recover, and graze as growth permits in July and August.

There is no record of livestock bloat when grazing birdsfoot trefoil pastures.



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